Turbidity

EQUIPMENT

Hach 2100 P portable turbidimeter

Silicone oil and cloth

Sample vials

StablCal Formazin standards (<0.1, 20, 100, 800 NTU)

Gelex standards (0-10, 0-100, 0-1000)

Calibration log

METHOD SUMMARY

The Hach 2100P portable turbidimeter measures turbidity in the range of 0 to 1000 NTU (nephelometric turbidity units). Turbidity is a measure of the light-scattering properties of a sample, and can affect organisms through light attenuation or sedimentation. Special consideration is needed for precise very-low turbidity measurements (see manual for details).

The machine can operate on AC or alkaline batteries. Batteries should be removed for long-term storage. A low-battery light is displayed when battery power is low. The meter turns off after 5 minutes of non-use.

VIAL PREPARATION

- Any vials used for measurement of samples or standards should be clean and free of scratches.
- Vials containing samples to be measured should be rinsed (if necessary), dried and oiled with a minute amount of silicone oil. Use the velvet cloth to distribute oil and remove excess. Cloth will probably absorb enough oil over time to use on all vials, but can be re-oiled periodically.

SAMPLE HANDLING

Samples should be measured as soon as possible, since light-scattering properties can change with time. Keep samples cool until measured.

MEASUREMENT

- Turn on machine.
- Note date of last calibration in Calibration Log. If greater than three months, perform calibration (see Calibration section).
- Press RANGE to enter Auto-Range mode (displayed on screen).
- Read Gelex standards (see Quality Control section).
- Prepare samples for reading (see Vial Preparation section).
- Place sample vial in sample chamber with diamond aligned with line on the meter. Close lid.
- Press **READ**.
- Machine will return a reading in NTU.

- Record values on field or laboratory data sheet.

CALIBRATION

The machine should be calibrated quarterly during periods of use.

- Bring sealed StablCal standards to room temperature. If standards have been sitting for less than a week, invert 10 times, then let sit for 5 minutes. Otherwise, shake for 2-5 minutes, let sit for 5 minutes, then invert 5 times. DO NOT shake or invert <0.1 NTU standard. *Unsealed standards can also be used—see manual for preparation.*
- Turn on machine.
- Place <0.1 NTU standard in sample chamber and close the lid. *Always place standards in the sample chamber with the diamond aligned with the line on the meter*.
- Press **CAL**. **CAL S** and a flashing **0** should appear, and a reading of **0.000** should be visible.
- Press **READ**. The machine will count down to a stable reading, and automatically move to the next standard (flashing **1**, 20.0 displayed). Remove the standard.
- Place 20 NTU standard in sample chamber and close the lid.
- Press **READ**. The machine will count down to a stable reading, and automatically move to the next standard (flashing **2**, 100 displayed). Remove the standard.
- Place 100 NTU standard in sample chamber and close the lid.
- The machine will count down to a stable reading, and automatically move to the next standard (flashing **3**, 800 displayed). Remove the standard.
- Place 800 NTU standard in sample chamber and close the lid.
- Press **READ**. The machine will count down to a stable reading. Remove the standard.
- Press **CAL** to accept calibration.
- Read StablCal standards and record values in calibration log.
- Store StablCal standards in refrigerator if not used monthly.
- Prepare Gelex standards for reading.
- Read Gelex standards and record values in calibration log. *Always place standards in the sample chamber with the diamond aligned with the line on the meter. Close lid.*
- Store Gelex standards at room temperature.

QUALITY CONTROL

- Check for freshness of standards; they should not be more than one year old.
- Check method accuracy daily during periods of use by measuring the turbidity of the three Gelex standards. These should be within 10% of initial readings, as recorded in the calibration log—if not, recalibration of the machine is required. Record Gelex turbidity readings on field or laboratory turbidity data sheet.